INSECT CONDITIONS ON THE TARGHEE NATIONAL FOREST

1965

The following report is a brief summary of the major forest insect conditions on the Targhee National Forest during 1965. Material for this report was compiled from aerial survey data and supplemented by biological evaluations of infested areas.

The major forest insect problems are the mountain pine beetle, a defoliator complex on lodgepole pine, and the spruce budworm. Briefly, mountain pine beetle populations continued at a high epidemic level with well over 500,000 acres now being infested throughout the forest. Epidemic centers have increased in size in the Jackson Hill and Big Bend Ridge areas, and south along the eastern border to Victor, Idaho. A defoliator complex caused moderate to heavy defoliation to lodgepole pine stands in limited areas. Heaviest defoliation occurred along the west side of Bishop Mountain. Light to heavy defoliation by the spruce budworm and associated insects occurred on approximately 95,000 acres of Douglas-fir along the north end of the forest. A more detailed discussion of these problems follows:

Mountain pine beetle, Dendroctonus ponderosae Hopk. (D. monticolae).

Mountain pine beetle populations remained at an epidemic level throughout most of the Targhee Forest the past year. However, in most areas north of Bishop Mountain where control work was carried on against the previous generation of beetles, the number of newly attacked trees has decreased.

Data collected on Thurburn Ridge showed exceptionally high brood densities but an attack ratio of only 2-3:1. The stand composition is mixed, consequently, the beetles concentrate their attacks on the larger diameter pines. A potential for increase still exists and control efforts should be continued through next year.

Mountain pine beetle infestations in Snyder Creek and West Dry Creek are classed as static and if control efforts can be continued the outbreak should continue to decline in 1966.

Elsewhere on the Targhee Forest, epidemic conditions prevail and the ratio of newly attacked trees to trees killed last year was 1:1 or higher in all areas examined.

Brood samples, by area, buildup ratios and trend predictions follow:

Sample Area	Average Fall Brood Density/ sq. ft.	Buildup Ratio Old - New	Predicted Trend
Warm River	399.2	1:1	E-I Increasing
Porcupine	546.8	1:2	E-I Increasing
Calf Creek	204.0	No.Est.	E-I Increasing
Dry Creek	353.2	1:1-2	E-I Increasing
Bitch Creek	362.8	1:2.5-3	E-I Increasing
McRenold Reservoir	404.0	1:1-2	E-I Increasing
So. Fk. Badger Creek	333.2	1:2-3	E-I Increasing
Bull Elk	456.0	1:2	E-I Increasing
So. Fk. Leigh Creek	254.0	1:1	E-I Increasing
Teton Creek	174.8	1:1	E Static
Hawley Gulch	293.2	1:3	E-I Static
Windy Ridge	320.4	1:2-3	E-I Static
Moody Creek	355.2	1:3	E-I Static
Limekiln	311.2	1:2-2.5	E-I Static
Canyon Creek	428.4	1:1	E-I Static
Graham Spring	456.0	1:2.5	E-I Static
Horseshoe - Packsaddle	318.8	1:1.5	E-I Static
Sanderis Canyon	372.0	1:2-3	E-I Static
Antelope Flat	205.4	1:2	E-I Static
Bishop Mtn. - West	262.0	1:2	E-I Static
Thurburn Ridge	464.8	1:2	Static - decreasing
Snyder Creek	129.3	1:1	Static
West Dry Creek	120.6	1:1	Static - Decreasing

Past studies show that a fall brood density of 180 per square foot is about the breaking point between epidemic and endemic conditions in lodgepole pine stands in the Intermountain Region.

During 1965, aerial survey observers mapped many small 2 to 3 faded tree groups scattered from Victor, Idaho, south to Alpine, Wyoming. No new large areas of mountain pine beetle activity were observed.

Mountain pine beetle activity has increased at an alarming rate along the eastern side of the Targhee Forest. The primary movement of the beetle in the area from Teton Creek northward through Teton Basin to Warm River has been eastward. Operational surveys in these areas show over 109,000 newly infested trees are present on Forest lands; and on nearby state and private lands 58,000 newly infested trees occur. Infestation centers have increased in size and number of trees infested since 1962. All control units in these areas have sufficient mature and overmature lodgepole pine to sustain the infestation through next year. Biologically, there is no indication this tremendous population will be controlled by natural factors in the near future.

The mountain pine beetle infestation on the Rexburg District continues uncontrolled. The number of infested trees has increased yearly since 1959. Approximately 95 percent of the lodgepole pine type on this district is presently infested; however, suitable host trees have been depleted in some areas and others have only light infestation intensities. This infestation will undoubtedly continue at the present epidemic level until the beetles deplete the host type.

A variety of brood conditions were observed on the Forest during 1965. Normally, new attacks are made in the summer, the broods overwinter as eggs and young larvae, continue development with the onset of warm weather the following spring, mature, and attacks new trees that summer and fall. Exceptions to this were noted. In some instances, female beetles attacked trees late in the fall of 1964, ceased egg laying, overwintered, extended their galleries and continued egg deposition in the spring. The development period of the broods resulting from fall eggs was normal; however, broods developing from spring eggs either emerged and made new attacks late this fall, or remained in dead trees as mature larvae, pupae or callow adults. These will mature and may emerge early in 1966. Thus, it is theoretically possible to have three flight periods, the first being in the spring from mature broods overwintering in dead trees; the second being fall flights and subsequent new attacks resulting from spring egg deposition; and finally, normal summer flights. We have yet to observe the first two phenomena first hand, but this does not discount the possibility that they could occur. They would be, however, of little significance relative to the main flight period. We believe them to be unlikely for the following reasons: Mature broods overwintering in dead trees will be unduly exposed to parasites, predators, desication, and most important, adverse temperatures. If spring flights do occur, it will be by those beetles that ceased egg laying in the fall, overwintered, and

prior to or during gallery extension in the spring, emerged and either re-attacked the same tree or entered a nearby tree. Since the initial beetle "blowup" on the Targhee this phenomenom has been observed only four times in the Region. Late fall attacks are also highly improbable, for if the beetles do not emerge by early fall, they probably overwinter in the dead trees.

Lodgepole pine Terminal Feeders

Epidemic infestations of a complex of lodgepole pine terminal feeders, have caused moderate to severe defoliation of terminals on many thousands of acres of lodgepole pine on the Targhee National Forest since 1961. This feeding complex consists of the jack pine budworm, Choristoneura pinus Free.; another budworm, C. Lambertiana (Busck); the pine needle sheath miner, Zelleria haimbachi Busck; and the pine tube moth or needle tier, Argyrotaenia spp.

The most severe damage occurs along the northwest side of Bishop Mountain. Examinations showed that 100 percent of the current year's terminal growth was removed by these feeders. Trees usually refoliate the next year. No mortality has been observed in any of the infested areas. Feeding usually caused deformed or stunted growth, and all age classes are attacked. Overall growth losses have not been determined.

The infestation has now spread throughout most of the lodgepole stands of the northern half of Region 4. Extensive evaluations of this pest complex are planned for the near future in order to secure a better understanding of the biologies involved and to be able to estimate damage levels and forecast trends.

The infestation will probably continue to spread in the lodgepole pine stands of the region and defoliation is expected to remain at about the same level next year as was experienced this year.

Spruce budworm, Choristoneura fumiferana (Clem.)

Since 1956, the time when the first spruce budworm infestations were reported on the Forest, infestations increased in severity and extent until 1963, when more than 200,000 infested acres were controlled by aerial spraying. This successful spray operation resulted in a significant reduction of infested acreage in 1964 and little change in the extent or intensity of infestation was noted this year. The extent of the present infestation by major defoliation classes, as determined by aerial surveys is shown below.

Division	Defoliation Intensity			Total
	Light	Medium	Heavy	
East	9,000	4,200	3,800	17,000
West	37,100	38,400	5,400	80,900
Total	46,100	42,600	9,200	97,900

Less than ten percent of the total area received heavy defoliation this year. This area, east of Humphrey, was also heavily defoliated last year. Defoliation in other areas was light to moderate.

Most of the major infestation centers showed no appreciable change in size or intensity of damage from that reported in 1965. One exception, however, was the finding of visible defoliation on approximately 18,000 acres between the West Fork of Indian Creek and Pleasant Valley. Another exception was 2,400 acres of light defoliation in Douglas-fir east of Swan Valley. The infestation on the northeast side of Sawtelle Peak that was first reported in 1964 and the two infestations bordering Sheridan reservoir that were detected earlier, were not visible from the air this year.

Normally, accurate and consistent predictions regarding the following year's population levels and resulting damage can be made from data based on systematic sampling of a current year's egg masses and pupae. Collections from Douglas-fir foliage were made in ten areas on the Forest this year. Egg mass counts and pupal density classes for 1965, respective collection points, and damage predictions for 1966 follow:

Area	1965 Defoliation		1965 Collections		1966	
	Predicted*	Actual	Egg Masses (1000 sq.in.)	Pupal Density	Expected Defoliation	Trend
	%	%	(No.)	(Class)	%	
Dry Creek	15	50-75	6.0	I	25-50	Dec.
Targhee Creek ✓	15					Static
Taylor Creek		25-40				Static
Twin Creek ✓					25	Static
W. Camas Creek	15					Static
Rattlesnake Creek		50-75	3.1			
Gillian Creek ✓		50-75		III	25-50	
Snider Creek	15	50-75		I		
Howard Creek ✓	15	25-50	0.0	II		
Willow Creek	15	25	0.0	I	25	Dec.

* Based on 1964 egg mass and pupal density samples.

As noted above, damage predictions for 1965 were conservative. On the ground defoliation measurements consistently exceeded predicted defoliation. Adjustments have been made in sampling and interpretative techniques that should result in closer predictions in the future. A possible reason for the differences that occurred this year was that two other defoliators, a budmoth, possibly Zeiraphera sp. and the black-headed budworm, Acleris variana (Fern.), were found associated with the spruce budworm in some areas, particularly the 1963 Sevin spray area. Feeding damage from these insects was not distinguishable from that of the spruce budworm; consequently, next year's defoliation may exceed the level predicted for the spruce budworm. At this time we have no method for predicting future damage by these insects, either singly, together, or in combination with the spruce budworm.

Spruce budworm egg mass and pupal density counts indicate a receding trend for budworm populations in practically all of the infestation areas next year. The only exception to this may be in Dry Creek where egg populations were recorded as moderately high.

Spider mite infestations of Douglas-fir in the 1963 spray areas are generally low. The areas with the highest population levels this year were Twin, Dry, and Targhee Creeks. These areas, however, contained only low to moderately high populations. No change in spider mite activity is expected in 1966.

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